AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS

[0000.4] This application is a 35 USC 371 application of PCT/DE 2004/001200 filed on June 9, 2004.

[0000.6] BACKGROUND OF THE INVENTION

Please replace paragraph [0001] with the following amended paragraph:

[0001] ~~Prior Art~~ **Field of the Invention**

Please replace paragraph [0002] with the following amended paragraph:

[0002] The invention is ~~based on a~~ **directed to an improved** fuel injection system ~~as generically defined by the preamble to claim 1~~ **for an internal combustion engine**.

Please add the following new paragraph after paragraph [0002]:

[0002.5] Description of the Prior Art

Please replace paragraph [0003] with the following amended paragraph:

[0003] A common rail injector (**hereinafter,** CR stands for "common rail") with a piezoelectric actuator (or piezoelectric controller) and with boosting by hydraulic couplers is known. Integrated couplers with pistons disposed coaxially inside one another are also known. **One** [[The]] known device uses an outward-opening valve as a control valve. This valve can be embodied with only a relatively small diameter, since otherwise the forces on the valve become too high, so that it cannot be actuated by a piezoelectric actuator.

Please replace paragraph [0004] with the following amended paragraph:

[0004] ~~Advantages of the Invention~~

SUMMARY AND ADVANTAGES OF THE INVENTION

Please replace paragraph [0005] with the following amended paragraph:

[0005] The fuel injection system of the invention for internal combustion engines~~[[,]] having the definitive characteristics of claim 1,~~ has the advantage over the prior art that a common rail injector with a piezoelectric actuator is created, in which a large cross section of the valve is possible. As a result, the opening and closing of the injection valve can be effected faster. The integrated coupler makes a short structural length of the device possible. The coupler is reinforced by CR pressure.

Page 2, please replace paragraph [0006] with the following amended paragraph:

[0006] ~~Drawing~~ **BRIEF DESCRIPTION OF THE DRAWING**

Please replace paragraph [0007] with the following amended paragraph:

[0007] One exemplary embodiment of the fuel injection system of the invention is ~~shown in the drawing and described in further detail in the ensuing description. The~~ **described more fully herein below, with reference to the** sole **drawing** figure **which** shows the essential components of a fuel injection system of the invention, with an injection valve and a control valve as well as a hydraulic coupler.

Please replace paragraph [0008] with the following amended paragraph:

[0008] ~~Description of the Exemplary Embodiment~~

DESCRIPTION OF THE PREFERRED EMBODIMENT

Please replace paragraph [0009] with the following amended paragraph:

[0009] The fuel injection system [[1]] of the invention is supplied with fuel at high pressure by a pressure reservoir (common rail) 3 via a high-pressure line 5, from which fuel flows via an injection line 6 to reach an injection valve 9. An internal combustion engine normally has several such injection valves, and for the sake of simplicity only one is shown. The injection valve 9 has a valve needle (valve piston, nozzle needle) 11, which in its closing position, with a conical valve sealing face 12, closes injection openings 13 through which fuel is to be injected into the interior of a combustion chamber of the engine. The fuel reaches the vicinity of the nozzle needle via an annular nozzle chamber 14, from which, via a control face 15 embodied as a pressure shoulder, it makes it possible to exert a pressure in the opening direction of the nozzle needle. When this pressure exerts a force in the opening direction on the valve needle that overcomes forces acting counter to this opening, the valve opens.

Please replace paragraph [0010] with the following amended paragraph:

[0010] For controlling the opening and closing of the injection openings, an actuator 31 is used. As a function of a triggering at a mechanical outlet, this actuator generates a deflection and a force for actuating further elements. In this example, it is an electrically actuated actuator~~[[.]] In this example, it is an actuator which has a piezoelectric element,~~ namely a piezoelectric actuator. The actuator takes on a lengthened configuration or a shortened configuration as a function of an electrical triggering in the vertical direction of the drawing, and thus in its own longitudinal direction. In this example, an actuator is provided with a construction such that when current is supplied (upon connection to a source of direct current), it assumes a lengthened configuration but without current it assumes a shortened

configuration. The actuator forms a capacitive load, and when current is supplied continuously, it does not absorb any lost power. It may be advantageous or necessary to prestress the piezoelectric actuator by a tensing device, such as a spring, such that piezoelectric elements contained in the actuator are constantly in compression. This is familiar to those skilled in the art and will therefore not be discussed below. While the upper end of the piezoelectric actuator is anchored in the injection device in a manner not visible in the drawing, the lower end of the piezoelectric actuator serves to use its force and motion in the final analysis for opening and closing the injection openings. To that end, a hydraulic coupler 38 is provided for its coupling; the hydraulic coupler has one piston 39 coupled to the piezoelectric actuator and one further piston 40. In the present application, by means of the coupler, an increase in the travel of the further piston 40 in comparison to the travel of the piston 39 is generally necessary (by means of a suitable choice of the hydraulically operative piston areas). The construction and mode of operation of the hydraulic coupler will be described hereinafter.

Page 5, please replace paragraph [0013] with the following amended paragraph:

[0013] The movable valve piece 51 is embodied essentially conically, with a cylindrical extension. In particular, in the closed state, it rests with a conical part on the valve seat 53. The valve piece 51 is prestressed in the direction of its valve seat 53 by a compression spring 54 that is guided by the cylindrical extension. In its blocking position, it has been moved "outward", namely in the direction from the high pressure in the control chamber 43 to a region of lower pressure (leak fuel pressure). The outlet valve is in this case therefore called

an outward-opening valve. The side of the valve piece 51 facing toward the valve seat 53 is rigidly connected to an actuating part that is connected to the hydraulic coupler. The connection to the piston [[37]] **40** is advantageously tensionproof, for the sake of especially fast closing.

Page 6, please replace paragraph [0017] with the following amended paragraph:

[0017] The end regions of the pistons 39 and 40 oriented toward the actuator 31 engage the inside of a common booster chamber 72. The other end region of the piston 39 engages the inside of a filling chamber 71-2; this chamber communicates via bores in the lower end wall of the piston 40[[,]] **with filling chamber 71-1** which communicates with the line 5. The other end region of the inner piston 40 protrudes into the filling chamber 71-2. Via the guide gaps 65 and 67, the booster chamber 72 is filled. The booster chamber 72 is penetrated by the rod 61. The filling chamber 71-1 is penetrated by the rod 63. The pistons 39 and 40 move in opposite directions from one another, and they also, because of the desired travel boosting from the actuator to the control valve, move at different speeds.

Please replace paragraph [0018] with the following amended paragraph:

[0018] The actuator 31 (piezoelectric controller) is supplied with current and lengthened, in the closed state of the injection valve 9. For opening the control valve 41, the electric current to the actuator 31 is switched off, and the actuator becomes shorter. As a result, the piston 39 (first booster piston) is moved upward in the drawing, reinforced by the spring 75 and by the pressure in the filling chamber 71-2. In the booster chamber 72 and in the filling chamber 71-2, CR pressure (that is, pressure of the pressure reservoir or common rail) is [[as]] **the** system

pressure in the state of repose. In the booster chamber, as a result with the upward motion of the piston 39, the pressure increases. This pressure increase moves the piston 40 (second booster piston) downward and, by motion of the valve part 51 oriented in the same direction, opens the control valve 41, which is an outward-opening valve. For fast closure of the valve part 51, this part is preferably solidly connected to the rod 63 and thus to the piston 40. Because of the CR pressure in the booster chamber 72, the seat diameter d3 of the valve part 51 can be selected to be quite large, since the piston 40 largely compensates for this area with its side located in the booster chamber 72. The invention thus creates an advantageous outward-opening valve/servo injector with CR pressure reinforcement for very fast opening and closing of the injection valve. The coupler assures a short structural length.

Page 8, please replace paragraph [0022] with the following amended paragraph:

[0022] The system shown has still further characteristics. At least in one region of the rod 61, connecting the actuator 31 to the hydraulic coupler, at a distance from the chamber of the coupler closest to the actuator 31, there is a further filling chamber 90, which communicates with the line 5. In this example, the further filling chamber 90 surrounds the actuator 31 in its lower end region. Preferably, it surrounds the entire actuator 31. A guide gap 94 of the rod 61 is dimensioned for additional filling of the adjacent chamber **72** of the coupler with fuel that is under pressure. One advantage is in the additional filling of the coupler with fuel that is at high pressure.

Please add the following new paragraph after paragraph [0024]:

[0025] The foregoing relates to preferred exemplary embodiments of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.